

In the Claims

Claim 1-81 (cancelled).

Claim 82 (new): A method of forming a low electrical resistance metal silicide, comprising:

forming a first metal silicide layer over a substrate, the first metal silicide layer having a melting point higher than 1700°C and being metal-enriched, the first metal silicide layer having a thickness of at least about 50Å and comprising a predominate metal;

forming a metal-containing layer directly against the first metal silicide layer; the metal of the metal-containing layer predominately being a metal different than the predominant metal of the first metal silicide;

forming a silicon-containing layer directly against the metal-containing layer and on an opposing side of the metal-containing layer from the first metal silicide layer;

after forming the silicon-containing layer, converting the metal of the metal-containing layer to metal silicide to convert the metal-containing layer to a second metal silicide layer over the substrate; the second metal silicide layer having a bulk resistance of less than 30 micro-ohms-centimeter; the conversion of the metal of the metal-containing layer to the second metal silicide layer comprising incorporation of silicon from the silicon-containing layer into the second metal silicide layer; and

patterning the first metal silicide layer, second metal silicide layer and silicon-containing layer into a line having substantially vertical sidewalls extending along the first metal silicide layer, second metal silicide layer and silicon-containing layer.

Claim 83 (new): The method of claim 82 wherein the first metal silicide layer is formed on a non-silicon-containing electrically conductive material.

Claim 84 (new): The method of claim 82 wherein the silicon-containing layer consists essentially of silicon or conductively-doped silicon.

Claim 85 (new): The method of claim 82 further comprising forming a layer comprising silicon nitride over the silicon-containing layer, and wherein the patterning also patterns the layer comprising silicon nitride into the line.

Claim 86 (new): The method of claim 82 wherein the substrate comprises silicon, and wherein the first metal silicide layer is formed directly against the silicon of the substrate.

Claim 87 (new): The method of claim 82 wherein the first metal silicide layer consists essentially of tantalum silicide, and wherein the second metal silicide layer consists essentially of titanium silicide.

Claim 88 (new): A method of forming metal silicide comprising metal from one or more of Groups 3, 4, 8, 9 and 10 of the periodic table, the method comprising:

forming a first metal silicide layer over a substrate, the metal of the first metal silicide layer predominately being a refractory metal, the first metal silicide layer having a thickness of at least about 50Å;

forming a metal-containing layer directly against the first metal silicide layer; the metal of the metal-containing layer predominately being from one or more of Groups 3, 4, 8, 9 and 10 of the periodic table and being different than the predominate refractory metal of the first metal silicide layer;

forming a layer comprising silicon directly against the metal-containing layer and on an opposing side of the metal-containing layer from the first metal silicide layer;

after forming the layer comprising silicon, converting the metal of the metal-containing layer to metal silicide to convert the metal-containing layer to a second metal silicide layer over the substrate; and

patterning the first metal silicide layer, the second metal silicide layer and the layer comprising silicon into a line having substantially vertical sidewalls extending along the first metal silicide layer, the second metal silicide layer and the layer comprising silicon.

Claim 89 (new): The method of claim 88 wherein the layer comprising silicon consists essentially of silicon or conductively-doped silicon.

Claim 90 (new): The method of claim 88 further comprising forming a layer comprising silicon nitride over the layer comprising silicon, and wherein the patterning also patterns the layer comprising silicon nitride into the line.

Claim 91 (new): A method of forming titanium silicide, comprising:

forming a metal silicide layer over a substrate, the metal silicide layer consisting essentially of MSi_x where x is greater than 0 and where M is one or more metals other than titanium, the metal silicide layer having a thickness of at least about 50\AA ;

forming a titanium-containing layer directly against the metal silicide layer;

forming a silicon-containing layer directly against the titanium-containing layer and on an opposing side of the titanium-containing layer from the metal silicide layer, the silicon-containing layer consisting essentially of silicon or conductively-doped silicon;

after forming the silicon-containing layer, converting the titanium to titanium silicide;
and

patterning the metal silicide layer, titanium silicide and silicon-containing layer into a line having substantially vertical sidewalls extending along the metal silicide layer, titanium silicide and silicon-containing layer.

Claim 92 (new): The method of claim 91 wherein the substrate comprises silicon, and wherein the metal silicide layer is formed directly against the silicon of the substrate.

Claim 93 (new): The method of claim 91 wherein the silicon-containing layer consists essentially of conductively-doped silicon.

Claim 94 (new): The method of claim 91 wherein the line has a width of less than or equal to 0.25 micrometers.

Claim 95 (new): The method of claim 91 wherein the line has a width of less than or equal to 0.15 micrometers.

Claim 96 (new): The method of claim 91 wherein the line has a width of less than or equal to 0.11 micrometers.

Claim 97 (new): The method of claim 91 wherein the metal silicide layer consists essentially of tantalum silicide.